I might add here that I have had for a time, in a winter fernery, a large New-Jersey specimen of *Amblystoma tigrinum*, a foot in length. It is nocturnal in its habits, and remains during the day in its burrow. This extends through the long diameter of its prison, and has three outlets, which it keeps open. From one of them, as evening approaches, it projects its head, and watches with attention what is transpiring in the room.

In the same case are specimens of the common *Plethodon cinereus*, of both varieties. During this, as in former years, I observe that this species is nocturnal, and is a great climber. They will climb the rachis of a most slender fern or spear of grass, and lie in a coil on the end of a tall frond or other narrow support which may be sufficient to bear their weight, at a height of a foot or eighteen inches above the ground. They climb a plate of glass with great ease, by adhering closely to its smooth surface with their moist abdomen. When disturbed on some high perch among the herbage, they leap away by a sudden unbending of the coiled body, in the manner of some caterpillars.—*Silliman's American Journal*, Feb. 1871.

Note on the Infusoria flagellata and the Spongiæ ciliatæ.
By Prof. H. James-Clark, Kentucky University.

I send this note in hopes that it may be of interest to those readers of this Journal who have followed the recent discussions upon spontaneous generation and the doctrine of evolution. It is an effort to clear up the chaos of uncertainty which has reigned among the lower Protozoa for years past, and particularly in the heterogeneous group of so-called Sponges. The aim of the evolutionists is clearly, by refusing to recognize their truly organized structure, to depress these creatures to such a low level in grade that they shall appear but a step above the lifeless protoplasm which some think has been seen *almost* manufactured in the laboratory of the chemist. After hypothetically developing "organizable protoplasm" out of "inferior types of organic substances," which in the process, *per se*, under "the mutual influences" of its metamorphic forms, generates still more *sensitive* organic matter, until it finally attains to the possession of *vital* actions, the evolutionist imagines himself able "deductively to bridge the interval" between the so-called "nascent life" and the unmistakable vitalism of the slimy Rhizopod. (See Herbert Spencer, Appleton's Journal, Aug. 7, 1869, p. 598.)

My own researches have constantly tended in the opposite direction. In spite of the apparent physical simplicity of even the lowest of the Protozoa (*Amœba* and the like), their habits and the phenomena attendant upon their mode of locomotion, their determinate prehensile acts, so wonderfully like consciousness of an end to be accomplished, and their undeniably specialized digestive functions, all lead to the conclusion, which with me is a fact, that they possess

a degree of differentiation *in esse* as marked as that which we recognize as *potential* in the earliest stage of the vertebrate embryo. In the former the organization is present, but not circumscribed into regions; in the latter it is also present uncircumscribed, but it is to be eventually differentiated. The Sponges, with their supposed slimy protoplasm-like simplicity, have been in former years the hunting-ground of the developmentalists; but of late that group has been slipping out from under the feet of those philosophers.

Carter first detected the true *criterion* of their animality, though erring as to their classificatory relationship. It was my good fortune to prove their close alliance with the *Flagellata*, in a memoir (Mem. Boston Soc. Nat. Hist. vol. i. pt. 3, Sept. 1867, "On the Spongiæ ciliatæ as Infusoria flagellata"*), published some few years ago. I described certain monad-like infusoria which possessed a single *flagellum* surrounded by a projecting membranous collar. Some forms were appended to branching stems (*Codosiga*), and others were ensheathed in a funnel-shaped or urnæform tube (*Salpingœca*). The monadiform body of these I showed to be identical with the ciliate bodies of one of the Spongiæ ciliatæ (*Leucosoleniæ*), and homologized the branching stem and the ensheathing tubes of the former with the gelatinous mass of the latter, in which its monads were imbedded. The connexion seemed not even a step wide, so clear and unmistakable was the relationship. That there should ever be discovered a form which would lie so intermediate between these as to make me hesitate whether it belonged to the one or the other, I did not even hope for; but it has come unexpectedly. In Schultze's 'Archiv für mikroskopische Anatomie' (Bd. vi. 4, 1870) Cienkowsky describes, under the name of *Phalansterium*, a genus which consists of monad-like bodies with a *flagellum* and a projecting collar like those of *Codosiga*, *Salpingœca*, and *Leucosolenia*. Of the two species which he illustrates, one (*P. consociatum*) has monads enveloped in a broad funnel-shaped slimy sheath; and these sheaths are closely packed side by side, radiatingly, so as to form a shield-like or a hemispherical mass. This comes nearest to the *Salpingœca*. The other species (*P. intestinum*) possesses similar monads; but they are imbedded basally in a gelatinous intestiniform mass of slime (*Schleim*), "with their vibrating lashes extending in every direction" about the cylindrical colony. Originally each monad is endowed with a separate slime-sheath; but eventually these are all fused together into one common mass. Beyond this, to make a true sponge, we need but the presence of spicula, and open interspaces in the slimy mass between the monads leading to one common cavity. Introvert the layer of monads, and we produce the desired effect without doing violence to their relative positions. It is a mere matter of proportions, just as the inverted cyathiform rose-hip is none the less an ovariferous disk than the globular receptacle of the strawberry.—*Silliman's American Journal*, Feb. 1871.

* 'Annals,' 1868, vol. i. p. 133 &c.